WHAT IS CLAIMED IS:

1.   A method for generating a preamble sequence in an orthogonal frequency division multiplexing (OFDM) communication system having m
5   subcarriers in a frequency domain, the method comprising the steps of:

generating a preamble sequence of length n that is mapped to n subcarriers on a one-to-one basis, where n is less than m; and

assigning components constituting the preamble sequence to the n subcarriers among the m subcarriers on a one-to-one mapping basis, assigning
10   null data to remaining subcarriers excluding the n subcarriers from the m subcarriers, and then IFFT (Inverse Fast Fourier Transform)-transforming the assigned result into time-domain data.

2.   The method of claim 1, wherein the preamble sequence
15   generating step comprises the step of generating the preamble sequence so that the null data is inserted in a particular subcarrier corresponding to a direct current (DC) component in the frequency domain among the n subcarriers.

3.   The method of claim 1, wherein if m=256 and n=200, then the
20   preamble sequence is generated as follows:

P(-100:100)={

1 0 -1 0 -1 0 -1 0 1 0 1 0	[-100:-89]
1 0 1 0 -1 0 1 0 -1 0 -1 0 -1	[- 88:-76]
0 1 0 -1 0 1 0 1 0 1 0 1	[- 75:-64]
0 -1 0 1 0 1 0 1 0 -1 0 1 0	[- 63:-51]
-1 0 1 0 1 0 -1 0 -1 0 1 0	[- 50:-39]
-1 0 1 0 -1 0 1 0 1 0 -1 0 1	[- 38:-26]
0 1 0 -1 0 -1 0 -1 0 1 0 -1	[- 25:-14]
0 -1 0 -1 0 -1 0 -1 0 1 0 1 0	[- 13:- 1]
0	
0 1 0 -1 0 -1 0 1 0 -1 0 1 0	[1: 13]
1 0 1 0 1 0 -1 0 1 0 1 0	[14: 25]
1 0 1 0 -1 0 1 0 -1 0 -1 0 -1	[26: 38]
0 -1 0 1 0 1 0 -1 0 1 0 -1	[39: 50]

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0 -1  0 -1  0 -1  0 -1  0 -1  0 -1  0          [  51: 63]
-1  0  1  0  1  0  1  0 -1  0 -1  0              [  64: 75]
-1  0  1  0  1  0 -1  0 -1  0 -1  0  1           [  76: 88]
 0 -1  0 -1  0  1  0 -1  0 -1  0 -1              [  89:100]
```
5 }*sqrt(2)*sqrt(2)*(±1)

where '-n:n' represents subcarriers of $-n^{th}$ to n^{th} subcarriers.

4.   An apparatus for generating a preamble sequence in an orthogonal frequency division multiplexing (OFDM) communication system having m subcarriers in a frequency domain, the apparatus comprising:

a preamble sequence generator for generating a preamble sequence of length n that is mapped to n subcarriers on a one-to-one basis, where n is less than m; and

an inverse fast Fourier transformer (IFFT) for assigning components constituting the preamble sequence to the n subcarriers among the m subcarriers on a one-to-one mapping basis, assigning null data to remaining subcarriers excluding the n subcarriers from the m subcarriers, and then IFFT-transforming the assigned result into time-domain data.

5.   The apparatus of claim 4, wherein the preamble sequence generator generates the preamble sequence so that the null data is inserted in a particular subcarrier corresponding to a direct current (DC) component in the frequency domain among the n subcarriers.

6.   The apparatus of claim 4, wherein if m=256 and n=200, then the preamble sequence is generated as follows:

P(-100:100)={
```
 1  0 -1  0 -1  0 -1  0  1  0  1  0         [-100:-89]
 1  0  1  0 -1  0  1  0 -1  0 -1  0 -1       [- 88:-76]
 0  1  0 -1  0  1  0  1  0  1  0  1          [- 75:-64]
 0 -1  0  1  0  1  0  1  0 -1  0  1  0        [- 63:-51]
-1  0  1  0  1  0 -1  0 -1  0  1  0          [- 50:-39]
-1  0  1  0 -1  0  1  0  1  0 -1  0  1        [- 38:-26]
```

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      0  1  0 -1  0 -1  0 -1  0  1  0 -1          [- 25:-14]
      0 -1  0 -1  0 -1  0 -1  0  1  0  1  0       [- 13:- 1]
      0
      0  1  0 -1  0 -1  0  1  0 -1  0  1  0        [   1: 13]
      1  0  1  0  1  0 -1  0  1  0  1  0           [  14: 25]
      1  0  1  0 -1  0  1  0 -1  0 -1  0 -1        [  26: 38]
      0 -1  0  1  0  1  0 -1  0  1  0 -1           [  39: 50]
      0 -1  0 -1  0 -1  0 -1  0 -1  0 -1  0        [  51: 63]
     -1  0  1  0  1  0  1  0 -1  0 -1  0           [  64: 75]
     -1  0  1  0  1  0 -1  0 -1  0 -1  0  1        [  76: 88]
      0 -1  0 -1  0  1  0 -1  0 -1  0 -1           [  89:100]
}*sqrt(2)*sqrt(2)*(±1)
```

where '-n:n' represents subcarriers of -nth to nth subcarriers.